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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,857	02/06/2002	Michael Ortiz	0007975-0009	1406

30076 7590 07/13/2005

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EXAMINER
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JONES, HUGH M

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/071,857

Applicant(s)

ORTIZ ET AL.

Examiner

Hugh Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/24/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Claims 1-7 of U. S. Application 10/071,857, filed 02/06/2002 are presented for examination.

#### Priority

2. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the provisional application upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 1-7 of this application. The non-provisional document is replete with disclosure (mathematical equations, for example) that are not disclosed in the provisional document.

#### Oath/Declaration

3. The oath is objected to because there appears to be a question of inventorship. The priority document is authored by only one of the inventors.

#### Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ortiz et al. (one of the inventors) in view of Bandak et al. (abstract).

7. Ortiz et al. disclose

A method for simulating the impact of a projectile with a solid,  
comprising:

determining the dynamics of said projectile and said solid (section 4 – “simulation of the drop-weight dynamic fracture test);

calculating the contact forces of said projectile and said solid (section 4 – “simulation of the drop-weight dynamic fracture test); and

calculating the fragmentation of said solid (section 4 – “simulation of the drop-weight dynamic fracture test).

the method of claim 1, wherein the step of determining the dynamics is comprised of the steps of:

triangulating the geometry of said projectile with respect to said solid (section 4 – “simulation of the drop-weight dynamic fracture test); and

describing the properties of said projectile and said solid (section 4 – “simulation of the drop-weight dynamic fracture test).

the method of claim 2, wherein the step of calculating the contact forces

further comprises the use of nonsmooth contact analysis (section 4 – “simulation of the drop-weight dynamic fracture test).

the method of claim 3, wherein the step of calculating the contact forces further comprises the use of Newmark's explicit time stepping algorithm is to calculate contact forces in discrete time steps (section 4 – “simulation of the drop-weight dynamic fracture test – especially pg. 1277).

the method of claim 4, wherein the implementation of Newmark's explicit time stepping algorithm is comprised of the steps of

predicting an unconstrained configuration that identifies violated constraints (section 4 – “simulation of the drop-weight dynamic fracture test); and

returning the closest-point-projection of the predictor configuration onto an admissible set (section 4 – “simulation of the drop-weight dynamic fracture test).

the method of claim 5, wherein the implementation of Newmark's explicit time stepping algorithm further comprises the adoption of a penalty parameter in the predicting step (section 4 – “simulation of the drop-weight dynamic fracture test – especially pg. 1277).

the method of claim 6, wherein the step of calculating the fragmentation of said solid further comprises:

applying an irreversible cohesive law to said solid (section 4 – “simulation of the drop-weight dynamic fracture test);

applying an irreversible cohesive law to cracks in said solid as said cracks develop (section 4 – “simulation of the drop-weight dynamic fracture test); and

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applying an irreversible cohesive law to solid fragments as said fragments develop (section 4 – “simulation of the drop-weight dynamic fracture test).

8. Ortiz et al. do not expressly disclose the application of their finite element study of fracture of solids to skulls or bones, which are solids.

9. Bandak et al. disclose the use of finite element study to skull fracture.

10. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Ortiz et al. disclose with the Bandak et al. disclosure because Banda et al. disclose that finite element models can be used to study skull fracture.

**11. Any inquiry concerning this communication or earlier communications from the examiner should be:**

**directed to:**

Dr. Hugh Jones telephone number (571) 272-3781, Monday-

Thursday 0830 to 0700 ET,  
**or** the examiner's supervisor, Jean Homere, telephone number (571) 272-3780.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

**mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 308-9051 (for formal communications intended for entry)  
**or** (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

Dr. Hugh Jones

Primary Patent Examiner

July 10, 2005

HUGH JONES Ph.D.  
PRIMARY PATENT EXAMINER  
TECHNOLOGY CENTER 2100